

## CHAPTER 6

### MEC Support during Construction Activities

#### 6-1. Introduction.

a. This chapter discusses procedures for MEC support during construction activities (including construction activities related to remedial actions) on sites with known or suspected MEC. The purpose of MEC support during construction activities is to reduce the potential for exposure to MEC.

b. MEC support during construction activities may require only MEC standby support or subsurface removal, depending on an assessment of the probability of encountering MEC and the level of confidence associated with the determination.

(1) If the probability of encountering MEC is low (e.g., current or previous land use leads to an initial determination that MEC may be present), only MEC standby support will be required. MEC standby support is discussed in paragraph 6-6 below.

(2) When a determination is made that the probability of encountering MEC is moderate to high (e.g., current or previous land use leads to a determination that MEC was employed or disposed of in the area of concern), UXO-qualified personnel must conduct a subsurface removal of the known construction footprint and remove all discovered MEC.

(3) The level of effort for construction support is site/task-specific and will be determined on a case-by-case basis by the PDT in coordination with the MM CX.

c. When a determination is made that the probability of encountering MEC on a construction site is moderate to high (i.e., a subsurface removal of the known construction footprint will be conducted), an OE Safety Specialist will be on-site to provide safety oversight. When a determination is made that the probability of encountering MEC on a construction site is low (i.e., only MEC standby support is required), an OE Safety Specialist is generally not required on-site.

#### 6-2. UXO Team Composition.

a. General. For construction activities on sites with known or suspected MEC, the contractor shall provide a UXO team consisting of a minimum of two UXO-qualified

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personnel (one UXO Technician III and one UXO Technician II). The UXO team may include additional UXO-qualified personnel, depending on site- and task-specific conditions/requirements. The number of UXO teams will vary depending upon the total level of effort. Qualifications for contractor UXO personnel are discussed in EP 1110-1-18.

b. If subsurface removal is required in support of construction activities (i.e., there is a moderate to high probability of encountering MEC), the UXO team(s) must also meet the following standards:

(1) Each UXO team will not include more than six team members in addition to the UXO Technician III. The UXO Technician III will supervise all MEC operations and all personnel assigned to his/her team.

(2) A SUXOS will be on-site and will not supervise more than 10 UXO Technician IIIs. There will not be more than one SUXOS per project without prior approval from the Contracting Officer.

(3) The position of UXOSO will be required on all subsurface removal projects in support of construction activities; however, the positions of UXOSO and UXOQCS may be dual-hatted when there are less than 15 personnel on-site.

(4) A UXOQCS may not be required full-time on-site. However, QC functions will be performed for all field activities.

### 6-3. Planning.

a. The MEC support contractor shall prepare a Work Plan and ESS (if required) to supplement the construction contractor's or USACE's Work Plan/Site Plan as described in Chapter 3.

b. The UXO team will review any archival information available regarding the area of the proposed construction activities. If possible, the UXO team will determine the probable types of MEC that may be encountered and identify specific safety considerations.

6-4. Responsibilities. The UXO team members have the following responsibilities for MEC support during construction on a site with known or suspected MEC:

a. Provide the MEC recognition, location, and safety functions for the prime contractor during HTRW sampling activities.

- b. Conduct MEC safety briefings for all site personnel and visitors.

6-5. Authority. The OE Safety Specialist has final on-site authority on MEC procedures and safety issues. If an OE Safety Specialist is not present on-site, the UXOSO, or if a UXOSO is not assigned to the site, the senior UXO-qualified person has final on-site authority for MEC procedures and safety issues.

6-6. Standby Support.

- a. Standby support is required for construction activities on sites with known or suspected MEC if the probability of encountering MEC is low.

- b. The UXO team will meet with on-site management and construction personnel and conduct a general work and safety briefing, including:

- (1) Probable site hazards and site-specific safety considerations.
- (2) MEC standby support procedures.
- (3) Responsibilities and lines of authority for any MEC response.
- (4) Emergency response procedures.

- c. The UXO team will physically preview the actual construction footprint with the on-site management of the construction contractor and discuss visual observations and potential areas of concern. In the event that surface MEC is discovered, the UXO team will place flagging adjacent to the discovery for subsequent visual reference, select a course around the item, and lead any on-site personnel out of the area. The UXO team will assess the condition of the MEC to determine if a disposal action is required. If MEC is found on the surface, the PDT will perform a detailed assessment of the site to determine if the potential for encountering MEC is still low. If the potential for encountering MEC is raised to moderate to high, a subsurface removal for the construction footprint will be required. Refer to paragraph 6-7 for subsurface removal requirements.

- d. The UXO team will monitor all excavation activities in areas known or suspected to contain MEC. One member of the team will be positioned to the rear and upwind of the excavation equipment for continuous visual observation of activities. If the construction contractor unearths or otherwise encounters a military munition with an unknown filler, all excavation activities will cease. The UXO team will assess the condition of the military

munition to determine if a disposal action is required. Once MEC has been encountered in an excavation, no further excavation will be allowed at that location until EOD has removed the MEC. Excavation will not continue until a detailed assessment of the potential of encountering additional MEC is completed. If the PDT determines that the item was an anomaly and no other MEC are expected, then the excavation may continue. If the PDT determines through the available data that the probability of encountering additional MEC is moderate to high, then a subsurface removal of the construction footprint is required. Refer to paragraph 6-7 for subsurface removal requirements. The After Action Report will indicate that MEC was encountered and will summarize the resulting activities.

e. The UXO team is generally not tasked to perform MEC disposition activities during standby support of construction activities. If MEC that requires disposal is encountered, the procedures outlined in paragraph 5-13 of this pamphlet will be followed.

#### 6-7. Subsurface Removal in Support of Construction Activities.

a. A subsurface removal of the identified construction footprint is required when the probability of encountering MEC during construction-related excavation activities is moderate to high.

b. A subsurface removal requires close coordination among the on-site USACE management personnel, the construction contractor, and the MEC support contractor.

c. A surface removal may be required to remove any existing MEC from the surface of the work area prior to proceeding with subsurface removal activities. All military munitions debris, target materials, and non-MEC-related materials, which may interfere with a subsurface geophysical survey, will also be removed from the surface of the work area and staged for later disposition. The UXO team will perform surface removal activities.

#### d. Safety Considerations.

(1) Subsurface removal actions must be accomplished in strict accordance with the approved Work Plan, including all subplans (e.g., APP/SSHP, ESP, and ESS, if required) and appendices. Prior to commencing subsurface removal activities, the UXO team will provide a general work and safety briefing to all on-site personnel. This briefing will address the following:

(a) Probable site hazards and site-specific safety considerations.

- (b) Responsibilities and lines of authority for any military munitions response to MEC.
- (c) Emergency response procedures.

(2) Utility clearance and/or excavation permits, if required, must be obtained prior to the commencement of any intrusive activities near underground utilities. The UXO team is responsible for verifying that all necessary excavation permits are on-site prior to commencing operations. The construction contractor is responsible for contacting the appropriate agency(ies) or company(ies) to mark the location of all subsurface utilities in the construction area. All located utilities will be marked by paint, pin flags, or other appropriate means to visually delineate their approximate subsurface routing. The color will not conflict with the colors used in MEC activities. In the event that subsurface utilities are suspected in an excavation area, the UXO team must attempt to verify their location. The UXO team must be aware that not all utility lines will be detectable with geophysical equipment (i.e., not all utility lines are constructed of ferrous material).

(3) MSDs must be established in accordance with Chapter 3 for all MEC procedures (i.e., anomaly excavation, access and identification of MEC, MEC recovery, and MEC destruction). During these operations, non-essential personnel will withdraw to the MSD of the MGF D involved.

e. Area Preparation.

(1) Area preparation includes reduction and/or removal of vegetation that may impede or limit the effectiveness of subsurface removal actions. Vegetation reduction/removal may be accomplished through manual removal, mechanical removal, controlled burning, or defoliation. Selection of the appropriate land clearing strategy will be based on the type, fuzing and concentration of MEC; type and concentration of vegetation; topography; drainage patterns; terrain and soil conditions; and the level of required environmental and natural resource protection.

(2) Area preparation is not considered a MEC procedure. The UXO escort and anomaly avoidance procedures for access surveys presented in paragraph 5-6 of this pamphlet will be followed.

f. Geophysical Mapping/Analysis.

(1) A subsurface geophysical survey will be conducted to identify and locate all anomalies in the identified construction footprint. The various types of geophysical detection

instruments are discussed in Chapter 4. Subsurface geophysical surveys may be completed using detection instruments with real time or post-processing identification and discrimination techniques. All anomalies will be prominently marked with survey flagging or pin flags for subsequent intrusive investigation.

(2) Subsurface geophysical surveys are not considered a MEC procedure. The UXO escort and anomaly avoidance procedures for access surveys presented in paragraph 5-6 of this pamphlet will be followed.

(3) After the dig list is developed, the selected anomalies will be reacquired in accordance with the Geophysical Investigation Plan.

g. Anomaly Excavation.

(1) Anomaly excavation operations are required to intrusively investigate and identify the source of all anomalies located during the geophysical survey. During excavation operations, only essential project personnel may be within the exclusion zone. All anomaly excavation operations will comply with the provisions of 29 CFR 1926, Subpart P.

(2) UXO-qualified personnel will manually complete anomaly excavations of less than 1 foot. If an anomaly is deeper than 1 foot, earth-moving machinery (EMM) may be used to assist in excavation efforts unless site constraints or accessibility restrict or prohibit such use. EMM will not be used to excavate within 12 inches of an anomaly. When an anomaly excavation gets within approximately 12 inches of an anomaly, manual excavation must be used to complete the excavation.

(3) Only UXO-qualified members of a UXO team may conduct manual excavation operations. A non-UXO-qualified member of the UXO team may operate EMM used to assist in anomaly excavations. If more than one EMM will be used within the same work area, the TSDs described in Chapter 9 of EM 1110-1-4009 will apply to the EMMs.

(4) After the probable source of the anomaly is identified and removed, an approved geophysical instrument will be used to validate the process. If the geophysical instrument does not continue to detect an anomaly, then the excavation may be backfilled and restored in accordance with contract requirements.

6-8. MEC Destruction.

a. The Work Plan will include procedures for destruction of MEC recovered during construction activities. Destruction of recovered MEC can take one of three forms: in-place, on-site, or off-site. The decision regarding which technique to use is based on the risk involved in employing the disposal operation based on site-specific characteristics and the nature of the MEC recovered as determined by the UXO team. Additional information on MEC disposal operations can be found in TM 60A-1-1-31.

(1) In-Place Destruction. In-place destruction (blow-in-place) is a technique used when it is determined that moving the MEC to an alternate location for destruction is not acceptable. This technique is preferred because it exposes the minimum number of personnel. All in-place destructions will be conducted in a manner that ensures maximum control of the site. When this technique is employed, engineering controls may be used to minimize the blast effects.

(2) On-Site Destruction. If MEC is recovered in close proximity to occupied buildings, it may not be possible to safely destroy the item in-place. In this instance, the item may be moved to a part of the project site where destruction and disposal can safely take place. When a MEC is destroyed on-site, engineering controls may be used to minimize the blast effect, as well as to minimize residual contamination. Guidance for the on-site destruction of MEC is found in EP 1110-1-17.

(3) Off-Site Destruction. If transported off-site for destruction, MEC will be transported by either military vehicles or by a qualified UXO contractor. MEC is typically transported to an active military installation where it can be safely destroyed. Off-site transportation will be conducted in accordance with EP 385-1-95a and EP 1110-1-18. All UXO must be certified for shipment in accordance with paragraph 1-9 of TB 700-2. Paragraph 6-8c below provides additional information on transportation of MEC.

b. Safety. The following safety considerations for MEC destruction will be addressed in the Work Plan.

(1) The UXO team conducting MEC destruction activities will consist of at least three personnel, with a minimum of two UXO-qualified personnel, one UXO Technician III and one UXO Technician II. One member of the UXO team must always be located outside the MSD for intentional detonations to give warning and assist in rescue activities in the event of an accident.

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(2) Explosives or accessory equipment that is obviously deteriorated or damaged will not be used.

(3) Blasting caps will be at least a commercial No. 8 or equivalent and, for destruction activities requiring multiple caps, be from the same manufacturer.

(4) Blasting caps must be transported in approved containers and not be exposed to direct sunlight.

(5) The explosive end of blasting caps, detonators, and explosive devices will be pointed away from the body during handling.

(6) Blasting caps will not be buried. Detonating cord will be used to position blasting caps above the ground.

(7) Electric blasting caps must be tested for continuity prior to connecting them to the firing circuit. Upon completion of testing, the lead wires will be short-circuited by twisting the bare ends of the wires together.

(8) In the event of an electric misfire or non-detonation, the MEC destruction site must not be approached for at least 30 minutes. For non-electric procedures wait 1 hour after the maximum delay predicted for any part of the disposal shot has passed before starting to investigate. A post-search of the detonation site must be conducted to ensure complete MEC destruction and to ensure that no fires have started.

c. Transport.

(1) Existing site conditions may require that MEC that has been certified as acceptable-to-ship in accordance with TB 700-2 be transported to a designated MEC destruction location either on or off the project site.

(2) A Transportation Plan detailing the route and procedures to be used to transport the MEC must be prepared and accepted prior to engaging in any transport activities to ensure that all safety aspects of the movement have been addressed. The transport of MEC off-site must be performed in accordance with the provisions of EP 385-1-95a, EP 1110-1-18, and applicable state and local laws. Contractor personnel who, by contract requirement, are tasked with the responsibility of transporting or preparing shipments of MEC for transport over public roads must meet all training requirements of 49 CFR Part 172 and applicable state requirements.

(3) Safety. MEC will be transported from the discovery location to an alternate destruction location only as a last resort. Transportation of MEC will be in accordance with paragraph 1-9 of TB 700-2. Armed fuzes must be transported only when absolutely necessary and when all other avenues for in-place disposal have been exhausted. Safety considerations for the transport of MEC include the following:

(a) MEC packaging designs must provide a container with appropriate blocking and bracing to prevent migration of the hazardous filler. Padding will also be added to protect any exposed filler from heat, shock, and friction.

(b) Base-ejection-type projectiles must be transported with the base oriented to the rear of the vehicle and the projectile secured.

(c) Incendiary loaded munitions will be placed on a bed of sand and covered with sand.

(d) Loose pyrotechnic, tracer, flare, and similar mixtures will be placed in No.10 mineral oil or equivalent.

(e) White phosphorus-filled munitions will be immersed in water, mud, or wet sand.

(4) Manifest. A manifest will be prepared in accordance with 49 CFR 172.205 and 40 CFR 262.20 when transporting MEC over public roads in non-emergency situations. In emergency situations, military EOD personnel will respond. For the purposes of transportation and storage, MEC will be hazard classified in accordance with TB 700-2. Government personnel who are tasked to sign shipping papers must be trained and be given signature authority by their agency in accordance with the requirements of DOD 4500.9-R.

d. Explosives Management.

(1) If explosives will be required for the destruction of MEC, then an Explosives Management Plan will be prepared as part of the Work Plan. The Explosives Management Plan will be used to provide details on the management of explosives for a specific project in accordance with applicable regulations. The plan will include information on Acquisition, Initial Receipt, Storage, Transportation, Receipt Procedures Inventory, Unaccounted for UXO/Unauthorized Use of Explosives, and other areas.

(2) Explosives used for the destruction of MEC must be acquired and managed in accordance with applicable Federal, state, and local laws and regulations including, but not limited to, the following:

- (a) ATFP 5400.7 and 27 CFR.
- (b) DOD 6055.9-STD.
- (c) 49 CFR.
- (d) 29 CFR 1910 and 1926.
- (e) FAR 45.5.

(3) Acquisition. Explosives may be purchased only under a license issued by the ATF. The license holder must provide written authorization designating the individual(s) authorized to purchase, store, or utilize explosives. This letter must specify the name, home address, date and place of birth, and the social security number of the designated individual(s). A copy of the letter must be maintained at the project office. In addition, the designated individual purchasing explosives may also be required to have a Blaster's License issued by the state in which the project is located. Explosives must be purchased from an ATF-licensed commercial distributor. The license holder must provide the distributor a certified statement of the intended use of the explosive material.

e. Temporary Explosives Storage Facilities on FUDS.

(1) When the contractor establishes a temporary storage area for explosives on a FUDS site, Type 2 magazines conforming to the standards set forth in Section 55.208 of ATF P 5400.7 must be used. The location of the proposed magazines and the Q-D arcs must be shown on a site map attached to the ESP. The Q-D arcs must be based on the NEW established for each magazine using the appropriate tables in DOD 6055.9-STD. In the event that existing site conditions prohibit the siting of the magazines in conformance with derived Q-D arcs and the NEW cannot be reduced to achieve conformance, the PM must request assistance in the design of engineering controls or structural modifications necessary to bring the magazine within the stated Q-D criteria.

(2) Explosives and initiators must be stored separately. If magazines are also used to temporarily store acceptable-to-ship MEC, each MEC must be stored in accordance with its appropriate HD and the storage compatibility group criteria listed in Chapter 3 of DOD 6055.9-STD. Each magazine must display the placards required by Department of Transportation regulations 49 CFR Part 172, Subpart F, for the HD of the MEC or explosives stored in the magazine.

(3) Lightning protection is not required for magazines located on FUDS if all of the following criteria are met:

(a) The magazine is constructed of 3/16-inch-thick steel or greater.

(b) The magazine is properly grounded.

(c) The magazine is located at least 6 and 1/2 feet from the nearest fence or any other magazine.

f. Temporary Storage Facilities on Base Realignment and Closure (BRAC) Sites/Active Installations.

(1) Temporary storage facilities for projects on BRAC sites or active installations must be determined using the installation's criteria.

(2) Lightning protection for temporary explosives storage facilities to be located on BRAC sites or active installations must meet the provisions of Chapter 7 of DOD 6055.9-STD.

g. Security.

(1) The Work Plan will describe the inventory control system to be implemented for explosives management. Magazine Data Cards documenting explosives transfers for each magazine must be completed with a copy maintained within the associated magazine. Explosives issued and unexpended must be returned to the magazine at the end of each workday.

(2) The inventory control system must include provisions for the physical inventory of the stored MEC and explosives at least weekly. Actual quantities must be reconciled with the quantities annotated on the corresponding Magazine Data Cards. Any discrepancies must be immediately reported to the USACE representative and an audit initiated to determine the source of the discrepancy.

(3) A physical security survey will be conducted in accordance with AR 190-11 to determine if fencing or guards are required when temporary storage facilities are used. Generally, a fence around the magazines is needed, but the contractor is responsible for determining the degree of protection required to deter the theft of MEC or explosives stored in the magazines.

(4) Locks used on magazines at a FUDS will meet the standards listed in Section 55.208 (a) (4), ATF P 5400.7. BRAC and Installation Restoration site requirements must be determined using the installation's criteria. A key control system will be documented in the Work Plan.

h. Fire Prevention. A Fire Prevention Plan will be prepared and coordinated with the fire department with primary response responsibility. Fire extinguishers of an appropriate size and type must be located at all temporary explosives storage facilities.

i. Records. Records must be maintained for all transactions and expenditures of explosive materials for a period of five years from the date of transaction in accordance with ATF regulations. These records must be maintained at the project office during on-site operations and subsequently at the business office of the ATF license holder.

j. Munitions Debris Management. The Work Plan must include operational and QC procedures for the processing, demilitarization, and disposition of inert ordnance, range-related debris, and munitions debris that fall within the classification of Material Potentially Presenting an Explosive Hazard (MPPEH). Contact the MM CX for the requirements on MPPEH processing and disposition.

#### 6-9. Quality Management.

a. QC.

(1) The UXO team is responsible for the QC of all surface and subsurface removal activities and for ensuring that only those procedures and processes conforming to contractual requirements and accepted project plans are implemented. The UXO team will develop a Quality Control Plan (QCP) outlining the quality activities to be used for continually assessing the implementation, effectiveness, compliance, and adequacy of operations.

(2) A separate UXOQCS is not required on-site full-time for MEC support activities. However, the MEC support contractor shall perform QC reviews of all field activities in accordance with the accepted QCP.

(3) The QCP will provide procedures for validation of the following:

(a) Surface removal and related activities are conducted in accordance with accepted project plans.

(b) Subsurface removal and related activities are conducted in accordance with accepted project plans.

(c) Actual probabilities of detection are consistent with removal reliability levels and USACE and DDESB requirements.

(d) Subsurface removal operations provide for an adequate level of confidence of MEC detection and removal to specified depths.

(e) Disposition of MEC and materials classified as MPPEH has been completed and documented. Procedures are available from the MM CX.

b. Quality Assurance.

(1) Districts should include MEC support capabilities in all applicable contracts for construction activities on FUDS or active military sites. MEC concerns must be addressed before initiating any construction activities. Items developed for MEC support of construction activities (i.e., SOW, Work Plan, APP/SSHP, ESP, and ESS, if required) must be submitted to the MM CX for review and approval in accordance with the roles and responsibilities set forth in Chapter 1 of this pamphlet prior to initiation of on-site activities.

(2) The district is responsible for supervising the fieldwork and ensuring contractor compliance with all accepted plans. The MM CX may also conduct random inspections to verify conformance. Upon completion of the MEC support activities, the PM will ensure that an After Action Report is submitted to the MM CX.